Cervical nerves.	Reference.	Views previously held.	Authors' views.
I.	All authors. Volkmann, *loc. cit.*	Nil save posterior neck muscles. Sterno-hyoid and sterno-thyroid supplied.	I. Depressors of hyoid, especially sterno-hyoid and sterno-thyroid.
II. III.	Hermann, *loc. cit.* Quain, *loc. cit.* Bastian, *loc. cit.*	"Supply" infra-hyoid muscles with descendens noni.	II. Depressors of hyoid, especially omo-hyoid. III. Nil motor.
II (alone).	Other authors. Volkmann, *loc. cit.*	Supplies the small muscles of neck, but not the depressors of hyoid.	

II. "An Additional Contribution to the Placentation of the Lemurs." By Professor Sir Wm. Turner, Knt., M.B., LL.D., F.R.S. Received May 21, 1888.

In 1876 I contributed to the Royal Society a memoir "On the Placentation of the Lemurs," which was published in the 'Philosophical Transactions' of that year (vol. 166, Part 2). The gravid uteri which I examined and described were from specimens of *Propithecus diadema*, *Lemur rufipes*, and *Indris brevicaudatus*. The examination showed in these Lemurs that the placental villi were diffused over the greater part of the surface of the chorion, so as to approximate in general plan with the arrangement in the Pig, Mare, and Cetacean, though of course with special characters of their own; that there were also distinct areas on the chorion free from villi; that the uterine mucous membrane possessed multitudes of crypts, from out of which the villi were easily drawn; that smooth patches of mucous membrane devoid of crypts, and corresponding to the non-villous parts of the chorion were present, towards which the stems of the uterine glands converged in a remarkable manner, and on the surface of which they opened by obliquely directed mouths in considerable numbers. Further, it was pointed out that the chorion occupied both horns of the uterus, though the part which was prolonged into the non-gravid horn was only a short diverticulum, and that the allantois formed a large persistent sac, which, like the sac of the amnion, did

not extend into the diverticulum of the chorion. The specimens were at different stages of gestation, but none was at the full time, though the fœtus of *Propithecus* was well developed, and measured, without including the tail, 5 inches in length.

In April of the present year I received from F. E. Beddard, Esq., Prosector to the Zoological Society of London, the gravid uterus of a Lemur, which he informs me was *Lemur xanthomystax*. The animal had died during labour. On examining the specimen the uterus showed no signs of inflammation, but its posterior wall was ruptured immediately above the line of reflection of the peritoneum from the rectum on to it. The caudal end of the fœtus occupied the upper third of the vagina, the membranes having been torn so as to allow the passage of the hinder part of the trunk out of the uterus. The uterine vessels were then filled with a carmine and gelatine injection, and the vessels of the chorion were partially filled with a blue injection through the umbilical trunks.

The uterus was somewhat smaller than that of *Propithecus diadema*, described in the memoir above referred to. As in that specimen it seemed on external examination as if it were a single uterus, but when opened into it was seen to possess a largely dilated left cornu, containing the head of the fœtus, and a short right cornu, dilated to about the size of a walnut, both of which freely communicated with the cavity of the corpus uteri; a depending fold of mucous membrane not half an inch deep separated the cornua from each other. The vagina was about 60 mm. long, and with a smooth mucous membrane. The os uteri was defined by a circular fold of mucous membrane. Each ovary was only about half the size of a common pea, and the left one contained a highly vascular corpus luteum.

The folds and sulci of the mucous membrane both of the corpus and cornua uteri with their numerous crypts, corresponded generally with those previously described and figured by me in *P. diadema*. The largest area of smooth mucous membrane was immediately above the os uteri; that next in size was situated around the orifice of the left Fallopian tube, whilst a smaller one surrounded the opening of the right tuba. Smooth areas were interspersed amidst the mucous folds; they were much less vascular than the folds and crypts, but as, both in their appearance to the naked eye and their relation to the openings of the uterine glands, they corresponded closely to what I have previously described in *P. diadema* and *Lemur rufipes*, I need not further describe them. The epithelial contents gave to the uterine glands a yellowish colour; but it was difficult to individualise in them the separate cells, the contents of which were granular, and the outlines indistinct. It seemed indeed as if the cells were in process of degeneration, owing to the period of gestation having come to an end, and as parturition had begun, the glands were no longer required to

take a part in the nutrition of the fœtus. The gland-layer of the mucous membrane was readily distinguished subjacent to the crypt-layer.

The folds and crypts surrounding the smooth areas of the mucosa were highly vascular. The crypts opened freely on the surface, and to some extent smaller secondary crypts branched off from the larger depressions. The distribution of the compact capillary network in the walls of the crypts resembled the arrangement previously figured in *P. diadema*.

I drew the chorion away from the uterine mucosa by gentle traction, and in the process of detachment the villi came out of the crypts with great ease. A considerable area of chorion next the os uteri, some of which had been torn in the descent of the fœtus, was free from villi and not very vascular. As one traced the chorion from the os, short scattered villi in the first instance projected from it, to be succeeded still further away by longer and broader villi arranged either in tufts or rows, the size and arrangement of the villi being adapted to the crypts in the mucosa. Opposite the uterine opening of the left Fallopian tube an area of the chorion about 33 mm. in its longest diameter was smooth and free from villi: it was placed at the end of the chorion furthest removed from the os uteri. A much smaller non-villous area of chorion corresponded to the opening of the right tuba, and was much nearer to the os than was the case with the non-villous area opposite the left tuba; in the right cornu the villi were arranged in low ridges, and the ridges and furrows in the uterine mucous membrane were shallow. Owing to the shortness of the right uterine cornu, the chorion lodged within it formed only a slight projection of the general bag of the chorion. Smooth patches of chorion, in apposition with the corresponding smooth areas of the mucosa, were interspersed amidst the rows and tufts of villi which covered so large a proportion of the free surface of the chorion.

The blue injection which had been passed into the umbilical trunks had filled the vessels ramifying in the deeper layer of the chorion, which could be seen both in the villous and non-villous parts of the membrane not unfrequently having a tortuous course. Opposite the bases of the villi these vessels gave off small branches which entered the villi and formed in them a close network of capillaries.

The large sacs both of the amnion and allantois in *L. xanthomystax* closely corresponded in arrangement with those previously described by me in *Lemur rufipes*.

The fœtus was 19 cm. long from the tip of the nose to the root of the tail, and the tail was 14 cm. long. It was evidently quite mature and the hairs and nails were well developed. The lower incisors had partially cut the gum. Both in this specimen and in the *Propithecus diadema* previously described the breech was the presenting part, and

the head was near the Fallopian tube belonging to the more dilated of the two uterine cornua. In three specimens of *Lemur rufipes* described in my previous memoir, the head was in proximity to the os, and the caudal end of the fœtus was in the more dilated horn. It would appear, therefore, that in the Lemurs, either the head or breech may be the part of the animal first to be born.

The examination of the gravid uterus of *Lemur xanthomystax* confirms, therefore, the conclusions to which both Alphonse Milne Edwards* and I had arrived independently in our previous investigations, that the placenta in this important group of animals is diffused and non-deciduate, and that the sac of the allantois is large and persistent up to the time of parturition. In these important respects, therefore, the Lemurs are, in their placental characters, as far removed from man and apes as it is possible for them to be.

Although I am not disposed to attach too much weight to the placenta as furnishing a dominant character for purposes of classification, yet I cannot but think that animals which are megallantoid, non-deciduate, and with the villi diffused generally over the surface of the chorion, ought no longer to be associated in the same order with animals in which, as in the apes, the sac of the allantois early disappears, and the villi are concentrated into a special placental area, in which the fœtal and maternal structures are so intermingled that the placenta is highly deciduate. Hence I am of opinion that the Lemurs ought to be grouped apart from the Apes in a special order, which may be named either with Alphonse Milne Edwards *Lemuria*, or with Victor Carus and others *Prosimii*.

Addendum.—June 2.

After the fœtus had been mounted for preservation in spirit, delicate flakes of a translucent cuticular-looking membrane were seen partially to float off from the surface of the abdomen and from the ventral surface of the limbs. In the groins and axillæ the membrane was very distinct, and formed an almost complete covering for the surface of the limbs external to the hairs, which, though of some length, were few in number, and scattered over the surface of the skin. On the dorsal aspect of the fœtus, both on the head, trunk, and limbs, where the hairs were longer and closely set together, the flakes were much more fragmentary and over considerable areas were absent. The appearance presented was such as to lead to the impression that flakes of a cuticular membrane, subjacent to which the hairs had been developed, were in process of being shed.

* "Histoire Naturelle des Mammifères de Madagascar," forming vol. 6, chap. ix, of Grandidier's 'Histoire de Madagascar.'

A number of years ago, Professor Hermann Welcker, of Halle, described by the name of *Epitrichium* a cuticular membrane, situated superficial to the hairs, which formed a complete envelope to the fœtus of *Bradypus tridactylus*, *Cholopus didactylus*, *Myrmecophaga didactyla*, and *Dicotyles*. He figured it *in loco* both in *Bradypus* and *Dicotyles*.* It was obviously quite distinct from the amnion.

In a memoir "On the Placentation of the Sloths," published in 1873, I described and figured the epitrichium in *Cholopus hoffmanni*,† and stated that I had also seen a similar arrangement in a fœtus of *Bradypus tridactylus*. In a subsequent dissection of the gravid uterus of *Bradypus tridactylus* I have recognised that this membrane in its relations to the fœtus corresponded with Welcker's figure and description. In these animals the epitrichium formed a complete covering of the fœtus, and closely followed the contour of the head, trunk, and limbs, immediately external to the hairy coat which was situated in the interval between the epitrichium and the skin; though the epitrichium was perforated at the muzzle by the long tactile hairs which grew from the lips. It was adherent to the cuticle of the margins of the eyelids, of the orifice of the nose, mouth, external auditory meatus, and anus, and was also attached to the soft cuticle around the roots of the claws. It was entirely distinct from the amnion, and from its relations to the hairy coat was obviously the layer of the epidermis situated superficial to the hairs, and which had become elevated as a distinct and continuous membrane as a result of their development and growth.

From its relation to the hairy coat, the cuticular membrane on the fœtus of *Lemur xanthomystax* was without doubt a similar structure to the epitrichium investing the fœtus of the Sloths, but with this difference, that instead of forming a continuous envelope around the head, body, and limbs of the fœtus, it was broken up into flakes or patches, which were the best marked where the hairs were scattered, and had almost disappeared in the mature fœtus, where the hairy coat was thick and abundant.

The recognition of this membrane in *Lemur xanthomystax* led me to examine the fœtus of *Propithecus diadema*, referred to in my memoir "On the Placentation of the Lemurs," with the view of seeing if a corresponding structure was present. I found on immersing the fœtus in water, or in spirit, that similar membranous flakes floated off from the surface of the hair. In some localities they were so loose as to make it difficult to say what their original relation to the hairs had been, but in other places the membrane had not been disturbed, and the hairs were situated between it and the

* "Ueber die Entwicklung und den Bau der Haut und der Haare bei Bradypus," in 'Abhandl. der Naturforsch. Gesellschaft zu Halle,' vol. 9, 1864.

† 'Edinburgh Roy. Soc. Trans.,' vol. 27.

surface of the skin. It must be understood that this membrane was quite distinct from the amnion.

The epitrichium, therefore, is present both in the Lemurs and in the Sloths, but in the former it does not, after the hairy coat is developed, form a complete envelope for the fœtus, but is broken up before the termination of the period of gestation into more or less detached flakes of membrane.

III. "Note on the Coagulation of the Blood." By L. C. Wooldridge, M.D., M.R.C.P., Co-Lecturer on Physiology at Guy's Hospital. Communicated by Professor Victor Horsley, F.R.S., &c. (From the Laboratory of the Brown Institution.) Received May 24, 1888.

In a paper read before the Royal Society, April 26th, 1888, Dr. Halliburton offers some criticism of my views respecting the coagulation of the blood. In this note I shall briefly summarise and traverse the objections Dr. Halliburton raises to my theory and experiments.

I. Dr. Halliburton suggests that the substance I call A-fibrinogen —which I obtained by cooling peptone-plasma—is not a normal constituent of the blood plasma, but that it is a precipitate of a hemi-albumose, supposed by him to be present in the peptone which is injected into an animal for the purpose of obtaining peptone plasma. I do not use Witte's peptone, as Dr. Halliburton appears to have done, on account of its recognised impurity, but that obtained from Dr. Gruebler's well-known laboratory in Leipsic. This peptone is prepared according to Henniger's method. A 10 per cent. solution of it in $\frac{1}{2}$ per cent. solution of sodium chloride is quite clear after filtration.

It gives no precipitate on cooling to zero.

It disappears wholly from the blood within one or two minutes after injection.

Finally, A-fibrinogen has properties absolutely different from the peptone injected.

Dr. Halliburton appears to think that this substance, A-fibrinogen, exists only in peptone plasma.

I stated in a paper read before the Royal Society in 1885, "On a New Constituent," &c., that it was also present in salt plasma, and I gave details concerning it in the Croonian MS., which is in the archives of the Royal Society. I explained at length in the paper referred to by Dr. Halliburton, and published in Ludwig's 'Festschrift,' 1887, why there are, as has long been known, two varieties of salt plasma, namely, one containing, as I showed, no A-fibrinogen, this being not